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Information Bulletin

• Grade 6 Mathematics •

2000 – 2001 School Year

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Grade 6 Mathematics Assessment

General Description

The 2001 Grade 6 Mathematics Achievement Test consists of two parts.

Part A: Operations and Number Sense consists of 30 multiple-choice questions designed to assess the knowledge students have of number (see the *Alberta Program of Studies for K–9 Mathematics, June 1996*). The multiple-choice questions are grouped into four categories: seven addition/subtraction questions, seven multiplication/division questions, eight connecting experiences questions, and eight number relationship questions. The questions are randomly placed within the test. Each category is worth one mark for a maximum score of four. In order to receive one mark for each category, a student must correctly answer at least five questions in that category.

The test is developed to be completed in 30 minutes; however, students may take an additional 10 minutes to complete the test. Students are **not** allowed to use manipulatives or calculators when answering the *Part A* questions.

Part B: Multiple Choice consists of 50 multiple-choice questions integrated in narrative themes. This test is developed to be completed in 60 minutes; however, students may take an additional 30 minutes to complete the test.

Students record their answers on a separate machine-scorable answer sheet.

Students require HB pencils, rulers, and erasers. They may also need scrap paper.

Students may use manipulative materials and calculators when completing *Part B* of the assessment.

Reporting Categories

The following indicators briefly highlight the learnings related to the two reporting categories of knowledge and skills.

Knowledge

- recalls facts, concepts, terminology
- knows number facts
- recognizes place value
- knows the procedure for algorithms and computations
- knows the procedure for constructions and measurements
- knows how to use calculators/computers
- knows mental computation and estimation strategies
- shows basic mathematical concepts in concrete, pictorial, and/or symbolic modes

Skills

- applies a mathematical concept in a variety of familiar situations
- creates new problem situations that exemplify a concept
- judges reasonableness of answers
- justifies answers
- communicates why and when certain strategies are appropriate
- demonstrates relationships among numbers, operations, number forms, and modes of representation
- demonstrates relationships among geometric forms
- applies mathematical knowledge to solve problems
- uses a variety of problem-solving strategies
- applies mathematical concepts in new situations

Description of Mathematics Assessment Standards

The following statements describe what is expected of Grade 6 students who are meeting the *acceptable standard* or the *standard of excellence*, based on outcomes in the *Program of Studies*. These statements represent the standards against which student achievement is measured. It is important to remember that one test cannot measure all of the outcomes in the *Program of Studies*.

<i>Acceptable Standard</i>	<i>Standard of Excellence</i>
<p>Students who meet the <i>acceptable standard</i> in Grade 6 Mathematics have a basic understanding of mathematical concepts and related procedural knowledge. They demonstrate their understanding in concrete, pictorial, and symbolic modes and are able to translate from one mode to another. For example, students meeting the <i>acceptable standard</i> know that the solution to the number sentence $42 \times 2 = \square$ is 84, and they can demonstrate their understanding in concrete and pictorial ways. They are able to write related number sentences and verify them using manipulatives and diagrams.</p>	<p>Students who meet the <i>standard of excellence</i> in Grade 6 Mathematics have a thorough understanding of mathematical concepts and related procedural knowledge. They consistently demonstrate their understanding in concrete, pictorial, and symbolic modes, and easily translate from one mode to another. They are able to create problem situations to illustrate concepts and to analyze and explain relationships among concepts. For example, students meeting the <i>standard of excellence</i> can write all number sentences related to $42 \times 2 = \square$, justify them using manipulatives and diagrams, and create problem situations to exemplify the relationship.</p>
<p>Students who meet the <i>acceptable standard</i> are able to reflect upon, explain, and defend their ideas, using objects, diagrams, everyday and mathematical terminology, and, when appropriate, technology. They understand mathematical questions presented with objects, diagrams, or symbols in everyday and school settings. Students meeting the <i>acceptable standard</i> derive meaning from problem-solving experiences in their world and build on a foundation of previous learning.</p>	<p>Students who meet the <i>standard of excellence</i> are able to assess, explain, and defend their ideas clearly, using objects, diagrams, and exact mathematical terminology. They understand mathematical questions presented with objects, diagrams, or symbols in both common and unusual settings. Students meeting the <i>standard of excellence</i> derive meaning from problem-solving experiences in familiar and unusual settings and build on a foundation of previous learning.</p>
<p>Students meeting the <i>acceptable standard</i> perform the mathematical operations and procedures that are fundamental to mathematics in Grade 6 and apply what they know to solving routine problems in familiar settings. They can describe the steps they used to solve a particular problem and can defend their solution to the problem.</p>	<p>Students meeting the <i>standard of excellence</i> perform the mathematical operations and procedures that are fundamental to mathematics in Grade 6 and apply what they know to solving and creating novel problems. They can clearly describe the steps that they or other students used to solve a particular problem, and they can justify the solution as well as suggest alternative solutions and/or strategies.</p>
<p>Students meeting the <i>acceptable standard</i> have a positive attitude about mathematics and a sense of personal competence in using mathematics in their daily lives. They demonstrate confidence when using common mathematical procedures and when applying problem-solving strategies in familiar settings.</p>	<p>Students meeting the <i>standard of excellence</i> have a positive attitude toward mathematics and show confidence in performing mathematical tasks. They are self-motivated risk-takers who persevere when solving novel problems. They take initiative in trying new methods and are creative in their approach to problem solving.</p>

Blueprint

The blueprint for mathematics shows the reporting categories under which questions are classified. The number of questions in each category is approximate.

Mathematical Processes*	Knowledge	Skills	Number and Proportion of Marks
Operations and Number Sense	4	N/A	4 (7%)
General Outcomes*	Knowledge	Skills	Number and Proportion of Questions
Number <ul style="list-style-type: none"> • Develop a number sense for decimals and common fractions, explore integers, and show number sense for whole numbers • Apply arithmetic operations on whole numbers and decimals in solving problems 	6	11	17 (32%)
Patterns and Relations <ul style="list-style-type: none"> • Use relationships to summarize, generalize, and extend patterns, including those found in music and art • Use informal and concrete representations of equality and operations on equality to solve problems 	4	9	13 (24%)
Shape and Space <ul style="list-style-type: none"> • Solve problems involving perimeter, area, surface area, volume, and angle measurement • Use visualization and symmetry to solve problems involving classification and sketching • Create patterns and designs that incorporate symmetry, tessellations, translations, and reflections 	4	8	12 (22%)
Statistics and Probability <ul style="list-style-type: none"> • Develop and implement a plan for the collection, display, and analysis of data gathered from appropriate samples • Use numbers to communicate the probability of single events from experiments and models 	3	5	8 (15%)
Number and Proportion of Marks on Part A and Part B	21 (39%)	33 (61%)	54 (100%)

*From the *Alberta Program of Studies for K–9 Mathematics*, June 1996

Preparing Students for the Mathematics Test

Suggestions for Preparing Students

The best way to prepare students for writing the achievement tests is to teach the curriculum well and to ensure that children know what is expected. Many of the skills and attitudes that support test writing are, in fact, good skills and strategies for approaching all kinds of learning tasks.

Teachers are encouraged to familiarize their students with the types of questions that will appear on the test by discussing questions from achievement tests that are no longer secured. Then, have students share the strategies they used to answer the questions.

Teachers are also encouraged to share the following information with their students to help them prepare for the Grade 6 Mathematics Achievement Test.

Suggestions for Answering Multiple-Choice Questions

- Before you begin, find out
 - how much time you have
 - if you can use a calculator, tables, diagrams, manipulatives, etc.
- Ask questions if you are unsure of anything.
- Skim through the whole test before beginning. Find out how many questions there are and plan your time accordingly.
- Answer easier questions first, then go back to harder ones.
- Do not spend too much time on any one question. Make a mark (* or ?) beside questions that you wish to go back to.

- Read each question carefully, underline key words, and try to think of an answer before looking at the choices.
- Read all of the choices and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any choices that are wrong, then pick the choice that is best.
- If you don't know the right answer, guess. Answer all questions—there is no penalty for guessing.
- If time permits, recheck your answers.
- Double check to make sure you have answered everything before handing in the test.
- Note that the questions on the mathematics test are placed in real-life contexts and organized in narrative themes.
- Read the information given using the strategy that works best for you. You should either
 - look at all the information and think carefully about it before you try to answer the questions **OR**
 - read the questions first and then look at the information, keeping in mind the questions you need to answer
- Make sure you look at all forms of the information given. Information may be given in words, charts, pictures, graphs, or maps.
- When information is given for more than one question, go back to the information before answering each question.
- Check your work when you calculate an answer, even when your answer is one of the choices.

For further suggestions, see *Teaching Students with Learning Disabilities*, Alberta Learning, Special Programs Branch, pages LD 122 to 124.

ALL of the 2000 achievement tests are secured. The 1998 and the 1999 achievement tests are no longer secured and are posted on the Alberta Learning web site <http://ednet.edc.gov.ab.ca>.

Learner Assessment Branch Contacts

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